

AXIS

vertebrae are occasionally wholly (Right Whales) or partially (many Whales, Jerboa, certain Edentates) welded into a com-



FIG. 10.—Side view of axis of Dog. x f. o, Odontoid process ; pz, posterior zygapophysis ; s, spinous process ; t, transverse process ; v, vertebral canal. (From Flower's *Osteology*.)

FIG. 11.—Anterior surface of axis of Bed Deer, x -g. o, Odontoid process ; pz, posterior zygapophysis ; sn, foramen for second spinal nerve. (From Flower's *Osteology*.)

hined mass. Indications of this have even been recorded in the human subject.

The dorsal vertebrae vary greatly in number : nine {*Hyperoodon*) seems to be the lowest number existing normally ; while there may be as many as nineteen, as in *Centetes*, or twenty-two, as in *Hyrax*. These vertebrae are to be defined by the fact that they carry ribs, and the first one or two lumbar are often "converted into" dorsals by the appearance of a small supernumerary rib. The spinous processes of these vertebrae are commonly long, and sometimes very long. It is only among the Glyptodons that any of these vertebrae are fused together into a mass.

The lumbar vertebrae, which follow the dorsal, vary greatly in number. There are as few as two in the whale *Neobalaena*, as many as seventeen in *Tursiops*; this group, the Cetacea, contains the extremes. In the lumbar are found in the Lemurs *Indris* and *Loris*. As a rule the number of lumbar is to some extent dependent upon that of the dorsals. It often happens that the number of thoraco-lumbar vertebrae is constant for a given group. Thus the Artiodactyles have nineteen of these vertebrae, and the Perissodactyles as a rule twenty-three. A greater number of dorsals implies a smaller number of lumbar, and of course *vice versa*. The existence of a sacral region formed of a